REMARKS / DISCUSSION OF ISSUES

The present amendment is submitted in response to the Final Office Action mailed May 25, 2010. In view of the amendments above and the remarks to follow, reconsideration and allowance of this application are respectfully requested.

Status of the Claims

Upon entry of the present amendment, claims 1-8, 12-13 and 20 will remain pending in this application. Claim 1 has been amended. Claims 9-11 have been cancelled without prejudice or disclaimer. Claim 20 has been added. Applicants respectfully submit that no new matter is added by the present amendments.

Claim Rejections under 35 USC 102 / 103

In the Office Action, Claims 1-13 stand rejected under 35 U.S.C. §102 (b) as being anticipated by, or in the alternative, under 35 U.S.C. §103 (a) as being obvious over U.S. Patent Application No. 2005/0123863 ("Chang"). Claims 1-13 stand rejected under 35 U.S.C. §102 (b) as being anticipated by, or in the alternative, under 35 U.S.C. §103 (a) as being unpatentable over U.S. Patent Application No. 2005/0036184 and U.S. Patent No. 6,555,234 ("Piao").

It is respectfully submitted clarification of the claim language herein definitely recites the patentable distinctions of the claimed invention over the applied art. In any event, the present invention will be briefly described with reference to preferred embodiments thereof illustrated in the drawings of the present application.

The present invention provides methods for resolving printable defects caused by particle deposition onto surfaces when exposing a pattern on a resist film on a substrate. The invention provides the use of a transparent spacing layer termed an `immersion pellicle` or optical spacer. The `immersion pellicle` is designed to ensure that small bubbles/particles P, which are present in the immersion fluid L3, e.g. at the fluid/pellicle interface, are kept sufficiently `out of focus` during exposure of a surface, which no longer leads to a defective pattern after development. The invention provides a method of irradiating a surface immersed

in a fluid with a radiation source, the method comprising, applying a removable transparent layer to the surface, projecting radiation onto the surface through the immersion fluid and through the transparent layer, altering the solubility of the removable protective transparent layer after the immersion in the immersion fluid by either a post exposure bake process or by a flood exposure at a different wavelength to the wavelength of the radiation, and subsequently removing the transparent layer.

It is respectfully submitted that none of the cited and applied references teach:

(Claim 1 recites)

applying a removable protective transparent layer (L4) to the surface (L1, L2), wherein the removable protective transparent layer (L4) serves to space apart the surface (L1, L2) from the immersion fluid (L3),

projecting electromagnetic radiation onto the photosensitive layer (L2) of the surface (L1, L2) through the immersion fluid (L3) and through the removable protective transparent layer (L4), and

subsequently removing the removable protective transparent layer (L4) comprising:.

immersing the removable protective transparent layer (L4) in an immersion fluid without dissolving it,

altering the solubility of the removable protective transparent layer (L4) after the immersion in the immersion fluid ***by a flood exposure at a different wavelength to the wavelength of the radiation, and***

dissolving the removable protective transparent layer (L4).

[Emphasis Added]

(Claim 20 recites)

applying a removable protective transparent layer (L4) to the surface (L1, L2), wherein the removable protective transparent layer (L4) serves to space apart the surface (L1, L2) from the immersion fluid (L3),

projecting electromagnetic radiation onto the photosensitive layer (L2) of the surface (L1, L2) through the immersion fluid (L3) and through the removable protective transparent layer (L4), and

subsequently removing the removable protective transparent layer (L4) comprising:

immersing the removable protective transparent layer (L4) in an immersion fluid without dissolving it,

altering the solubility of the removable protective transparent layer (L4) after the immersion in the immersion fluid ***by a post exposure bake process****, and*

dissolving the removable protective transparent layer (L4).

[Emphasis Added]

Instead, Chang teaches an immersion lithography process including the steps of forming a photoresist layer on a material layer, and then forming a protective layer on the photoresist layer. An immersion exposure step is conducted to define an exposed portion and an unexposed portion in the photoresist layer. A solubilization treatment is then performed to solubilize the protective layer on the exposed portion of the photoresist layer. A development step is conducted to remove the exposed portion of the photoresist layer and the protective layer thereon to simultaneously pattern the photoresist layer and the protective layer. It is respectfully submitted that the development step of Chang to remove the exposed portion of the photoresist layer does not teach or suggest the steps for *subsequently removing the removable protective transparent layer (L4)*, as recited in claims 1 and 20.

Further, the cited portions of Yeo or Piao, alone and in any combination, fail to disclose or suggest the specific combination of claims 1 and 20. Yeo is silent with respect to steps for *subsequently removing the removable protective transparent layer (L4)*, as recited in claims 1 and 20, as noted in the rejection at pages 3 and 4 of the Office Action. The Examiner merely states that Yeo discloses an immersion lithographic system for irradiating a photosensitive on a substrate, both of which are immersed in a fluid. The apparatus of Yeo includes a light source, lens, imaging module, immersion fluid, photosensitive material, substrate and barrier provided on the photosensitive material. Yeo states that it is understood

that the barrier layer may be used in conjunction with a reduced thickness of photosensitive material to further reduce the amount of swelling. *See* Yeo, par. 54. There is no teaching of removing the barrier layer by either one of a post bake process or a flood exposure at a different wavelength to the wavelength of the radiation. As admitted by the Office, Piao teaches that a barrier layer (17) is stripped in a wet etching process. It is respectfully submitted that a wet etching process is different from a flood exposure at a different wavelength to the wavelength of the radiation or a post bake process, as recited in claims 1 and 20, respectively. Therefore claims 1 and 20 are allowable. Claims 2-8 and 12-13 depend from claim 1, which Applicants have shown to be allowable. Accordingly, Claims 2-8 and 12 are also allowable.

New Claim

New Claim 20 recites additional elements not disclosed or suggested by the above-cited references. For example, Claim 20 recites in relevant part, *altering the solubility of the removable protective transparent layer (L4) after the immersion in the immersion fluid* ***by a post exposure bake process.***

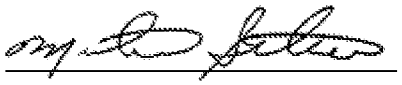
The cited portions of Chang, Yeo and Piao fail to disclose or suggest the above feature. Thus, New claim 20 is allowable.

Conclusion

In view of the foregoing amendments and remarks, it is respectfully submitted that all claims presently pending in the application, namely, Claims 1-8, 12-13 and 20 are believed to be in condition for allowance and patentably distinguishable over the art of record.

If the Examiner should have any questions concerning this communication or feels that an interview would be helpful, the Examiner is requested to call Mike Belk, Esq., Intellectual Property Counsel, Philips Electronics North America, at 914-945-6000.

Respectfully submitted,



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